

REMARKS

I. Status of the Application

Claims 1-7, 9-11 and 13-27 are pending in this application. In the March 10, 2006 office action, the Examiner:

- A. Objected to claims 1, 9, 16, 19, 21, 26 and 27 for specified informalities; and
- B. Rejected claims 1-7, 9-11 and 13-27 under 35 U.S.C. § 102(b) as being anticipated by U.S. Patent Application Publication No. 2002/0163072 A1 of Gupta et al. (hereinafter "Gupta").

In this Response, applicants have amended claims 1, 9, 16, 19 and 21 to further clarify the claimed invention. Applicants have also canceled claims 26 and 27, without prejudice. Applicants respectfully traverse the rejections of the claims and request consideration of the application in view of the foregoing amendments and the following remarks.

II. The Objections to the Claims are Moot

The Examiner objected to claims 1, 9, 16, 19, 21, 26 and 27 for having specified informalities. Claims 26 and 27 have been canceled, and therefore the objections to those claims are moot.

Regarding claims 1, 9, 19 and 21, the Examiner identified informalities in the claims and suggested changes to the claim language. Applicants gratefully acknowledge the Examiner's suggested amendments, and have adopted the same. As a consequence, it is respectfully submitted that the objections to claims 1, 9, 19 and 21 are moot.

Regarding claim 16, the Examiner identified an informality in claim 16 regarding the use of the word “may”. Prior to this amendment, claim 16 included the following limitation:

wherein the multiple-layer structure includes an insulating layer which may consist of a multiple stack of insulating layers.

The Examiner found that the word “may” tended to render the claim indefinite. Claim 16 has been amended herein as follows:

wherein the multiple-layer structure includes at least one ~~an~~ insulating layer ~~which may consist of a multiple stack of insulating layers.~~

In view of the amendment, the above limitation is no longer unclear or indefinite. As a consequence, it is respectfully submitted that the objection to claim 21 is moot.

Accordingly, each of the informalities noted by the Examiner in the March 8, 2006 office action have been addressed. It is therefore respectfully submitted that the objections to claims are moot and should be withdrawn.

III. The Rejection of Claim 1 is in Error

The Examiner rejected claim 1 as allegedly being anticipated by Gupta. As will be discussed below, Gupta fails to disclose or suggest each and every element of claim 1.

A. The Invention of Claim 1

Claim 1, as amended is directed to a method for producing a contact structure on a structured surface of a substrate. The method includes producing a first conductive layer on the structured surface, the first conductive layer comprising tungsten, and producing a conductive seed layer on the first conductive layer. The seed layer comprising a multiple-layer structure. Claim 1 has been amended to clarify that the first conductive layer is *not* part

of the multiple-layer structure. The method further includes electroplating the contact structure on the seed layer, selectively removing the contact structure. At least one of the layers of the multiple-layer structure of the seed layer acts as a stop layer in the selective removal.

B. Gupta

Gupta is directed to an integrated circuit wafer element and a method for bonding the same to produce a stacked integrated circuit. In pertinent part, the wafer element of Fig. 5 of Gupta has a substrate 110 with a trench 128. A via 127 is formed in the trench 128. The via includes a thin dielectric layer 125, a thin layer of SiN 126, and a dual purpose layer 130 that acts as a diffusion barrier and a stop layer. The dual purpose layer may be made of WN. According to the disclosed method, a copper seed layer is deposited in the trench 128 (presumably on the dual purpose layer 130), and then a copper layer 131 applied using electrochemical plating. (Gupta at [0027]-[0029]).

C. Gupta Fails to Disclose a Seed Layer Having a Multiple Layer Structure

Gupta fails to disclose, expressly or inherently, a step of “producing a conductive seed layer on the first conductive layer, the seed layer comprising a multiple layer structure”, as called for in claim 1. Moreover, Gupta certainly does not teach such a step resulting in a structure in which the “first conductive layer is not part of the multiple-layer structure”, as called for in claim 1 as amended.

At best, Gupta discloses a first conductive layer in the form of the dual purpose layer 130, which may be made of tungsten, and a *single* seed layer (not actually shown) discussed

in paragraph [0029]. Thus, Gupta does not disclose both a conductive layer made of tungsten and a seed layer having a *multiple-layer* structure, where the conductive layer is *not* part of the multiple-layer structure. As a consequence, Gupta does not disclose (or suggest) each and every element of claim 1.

In the March 10, 2006 office action, the Examiner alleged that the layers 125, 126 and 130 of Gupta form the claimed first conductive layer, and that the copper seed layer and the layer 130 of Gupta form the claimed multiple-layer structure of the conductive seed layer. (March 10, 2006 office action at p.4). However, the layer 130 of Gupta cannot constitute both the first conductive layer *and* part of the multiple-layer structure of the seed layer as claimed. It is respectfully submitted that, even as *originally* claimed, the first conductive layer could not be part of the claimed seed layer. In particular, as previously claimed, claim 1 included the step of “producing a conductive seed layer *on the first layer*, the seed layer comprising a multiple-layer structure”. Thus, the layer 130 cannot be a part of a seed layer structure that is produced on the conductive layer, because a layer cannot be “produced on” itself.

Regardless, as amended, claim 1 has been clarified to recite explicitly that the first conductive layer is *not a part of the multiple-layer structure of the seed layer*. Thus, the “first conductive layer” 130 of Gupta cannot constitute a part of the claimed seed layer. As a consequence, Gupta does not teach or suggest a seed layer having a *multiple-layer* structure.

Thus, the Examiner’s application of Gupta to claim 1 fails to identify both a first conductive layer comprising tungsten, and a seed layer having a multiple-layer structure that does not include the first conductive layer.

D. Conclusion as to Claim 1

For the foregoing reasons, Gupta does not disclose each and every element of the invention. As a consequence, it is respectfully submitted that the anticipation rejection of claim 1 over Gupta is in error and should be withdrawn.

IV. Claims 2-7, 9-11 and 13-25

Claims 2-7, 9-11 and 13-25 all stand rejected as allegedly being anticipated by Gupta. Claims 2-7, 9-11 and 13-25 all depend from and incorporate the limitations of claim 1. Accordingly, for at least the same reasons as those set forth above in connection with claim 1, it is respectfully submitted that the anticipation rejection of claim 1 over Gupta is in error and should be withdrawn.

V. Conclusion

For the foregoing reasons, it is respectfully submitted that applicants have made a patentable contribution to the art. Allowance of the application is therefore earnestly solicited.

Respectfully Submitted,



July 10, 2006

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